TWO MULTIBAND ANTENNAS FOR THE 160 METRE ENTHUSIAST

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Multiband antennas proliferate in amateur literature but few of these can be operated conveniently on 160 metres. Here are two multiband antennas which resonate on various bands from 160 metres upwards and both have been used at this QTH with excellent results. The diagrams show the details of these antennas, including information on the VK5QV traps used. The VK5QV traps are simple and inexpensive to build, a delight to tune, and they are utterly stable in operation.

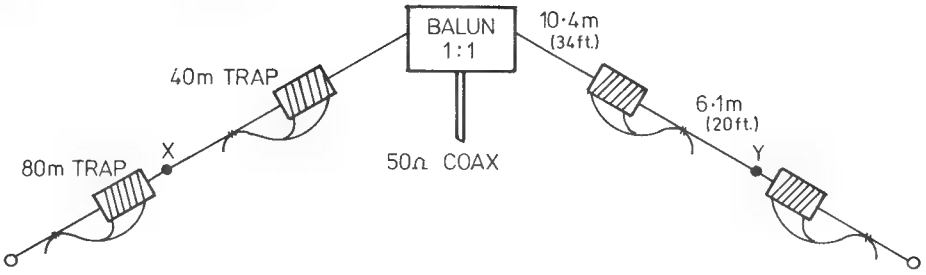

FIG. 1

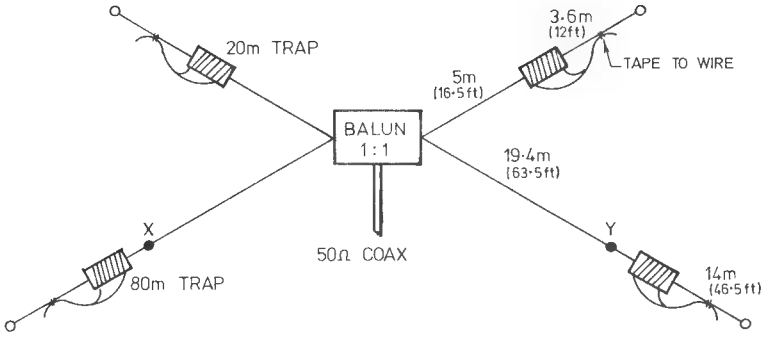

FIG. 2

Trap	Coil	Coax. Capac.
20m (14.2 MHz)	2.5 μH 10t. 7/.0076 PVC covered hook-up wire, 1⅛ in. o.d. PVC circuit	47 pF approx. 29 ins. RG 59/u coax.
40m (7.07 MHz)	10.7 μH 38t. 7/.0076 hook-up wire. 1 in. o.d. PVC conduit.	47 pF approx. 28 ins. RG 59/u coax.
80m (3.60 MHz)	27 μH 25t. 7/.0076 hook-up wire. 2¼ in o.d. PVC irreg. pipe.	80 pF approx. 48 ins. RG 58 coax.

NOTES:

1. **All coils are close wound.**
2. **Coaxial cable lengths should be treated as very approximate. Cut to longer lengths and trim back as GDO to frequency.**
3. **Antenna wire lengths above are only a guide. Allow extra length and prune as explained in text.**
4. **The braid of the coaxial capacitors is soldered to the OUTER wire sections of the antenna and the coax. itself is taped to these outer sections.**

First, let us consider the antenna shown in Fig. 1. This is a single antenna, fitted with traps so as to operate on 40, 80 and 160 metres. It also has a very low VSWR on 15 metres. Although quite a long antenna (approximately 175 feet span), it is still considerably shorter than a full-scale inverted vee for 160 (260 feet). The VSWR is very low on 15, 40 and 160 metres but you will find, in all probability, that the usable bandwidth on 80 metres will be restricted to about 120 kHz. This is not unusual with multiband trap antennae — compare the 18 AVT. If you do not relish this situation then you have at least three alternatives: (a) switch in an ATU to cover those sections of the band where the SWR is too high for comfort, (b) use an ATU for the 80 metre band entirely and operate bare-foot on the other bands, or (c) erect antenna in Fig. 2.

The procedure for setting up the antenna is quite simple. First put up the 40 metre sections, including the traps, and adjust the wire lengths for a VSWR of 1 to 1 at the trap resonant frequency. Next, add the 80 metre sections, including traps, and adjust the 80 metre wire sections for minimum SWR. Finally, add the 160 metre wire sections and adjust these for a 1 to 1 SWR at the centre of the band. That is all there is to it; there should be no necessity to go back and readjust any of the earlier sections.

The antenna shown in Fig. 2 is the one at present in use at this QTH. As is evident from the diagram, it is a combination of the multi-dipole concept and the trap concept; it consists of two trapped inverted vees fed by a common feeder. It covers all bands from 15 through to 160 metres; the VSWR is very low on all bands and no tuning unit is required. (Incidentally, it also covers 11 metres but this is of little value to us now.) If you wish to cover 10 metres also, you would need to insert 10 metre traps in the 20/40 metre vee.

The method of setting up the antenna in Fig. 2 is much the same as for the first antenna, except that two trapped dipoles have to be adjusted. First set up the 20/40 metre dipole and adjust the wire sections (as for Antenna A) for a 1 to 1 VSWR on both bands. When that is completed, repeat the procedure for the 80/160 metre dipole. I found that there was very little interaction between the two dipoles.

Admittedly, both of the antennas described here are long antennae, but they can be reduced considerably in span by bending the ends back at the points indicated in the diagrams (X, Y). By doing this Antenna A could be reduced to the span of a G5RV and Antenna B to that of an 80 metre dipole.

Two final comments: (1) antennae of this kind greatly simplify operating procedures. You can tune up quickly and completely on a dummy load and then switch into the antenna system to begin *immediate* operation without the additional fussing with an ATU (with its attendant QRM on the band). This enables you to change bands in seconds, not minutes! This kind of convenience has to be experienced to be appreciated. (2) Although details of the traps are given in the diagrams, you would be well advised first to refer to the admirable article of Ivan Huser VK5QV, "A Simplified Method of Antenna Trap Construction", in March 1977, AR. The only alteration I have made to the disposition of the traps is to tape the coaxial capacitors to the antenna wire for greater mechanical strength and (to my eye) a more pleasing appearance. ■